Redifon

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REDIFON LIMITED · LONDON · S.W.18

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Redifon

TECHNICAL DATA

HANDBOOK

- for -

RECEIVER TYPE R.145

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TECHNICAL DATA

SAFETY FIRST

Operation of electronic equipment involves the use of dangerous voltages. Operating personnel must at all times observe safety regulations. Do not change valves or make adjustments inside the equipment with the power supply on. Do not depend upon interlock switches for protection but always cut off the power supply before removing covers or other protective devices. Under certain conditions, dangerous potentials may exist in circuits with power controls in the off position, due to charges retained by capacitors. To avoid possible danger, always disconnect power, then earth circuits prior to touching them.

Although every practicable safety precaution has been incorporated in this equipment the following rules must be strictly observed:

KEEP AWAY FROM LIVE CIRCUITS. Under no circumstances should any person be permitted to reach within or in any manner gain access to any enclosure with power supply line switches to the equipment closed, or with interlock switches closed; or to connect any apparatus external to the enclosure to circuits within the equipment. Wherever feasible when testing circuits check for continuity and resistance rather than directly checking voltage at various points.

DON'T SERVICE OR ADJUST ALONE. Under no circumstances should any person reach within a unit for the purpose of servicing or adjusting the equipment without the immediate presence or assistance of another person capable of rendering aid.

DON'T TAMPER WITH INTERLOCKS. Under no circumstances should any interlock switch be removed, short circuited, or tampered with in any way by other than authorized maintenance personnel; nor should reliance be placed upon the interlock switches for removing voltages from the equipment.

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1.0

INTRODUCTION

The Redifon Receiver Type R.145 is a high grade general purpose communications receiver designed to meet the requirements of Ministry of Supply Specification K.114E.

It provides continuous coverage of the frequency range 2-30 Mc/s in fourteen switched bands each 2 Mc/s wide. The addition of a Low Frequency Adaptor unit (LFA.10) will extend this coverage down to 15 kc/s in four further overlapping bands. This unit is described in a separate handbook.

The receiver may be fitted with an optional single-sideband unit which will permit the reception of either sideband of double-sideband signals. This facility is primarily intended to provide improved reception of d.s.b. signals in the presence of adjacent channel interference and selective fading. It may also be employed for the reception of s.s.b. signals with either full carrier or partially suppressed carrier (up to 17 db). A Redifon Receiver Adaptor Type RA.10 may be used with the receiver to permit the high quality reception of s.s.b or i.s.b. signals with either partially or totally suppressed carrier. This unit is described in a separate handbook.

A crystal calibrator is available as an optional additional facility for checking the accuracy of the tuning scale calibration.

The receiver can be supplied either in a metal cabinet for desk mounting or, fitted with a light protective dust cover, for standard 19 inch rack mounting.

It is designed for operation from a.c. mains at 100-125 or 200-250 volts, 40-60 c/s, consuming approximately 140 watts with the LFA.10, s.s.b. unit, and crystal calibrator, on.

SUMMARY OF DATA

Frequency Range:-

2-30 Mc/s in fourteen bands each 2 Mc/s wide. The Low Frequency Adaptor Type LFA.10 extends the lower limit of this range down to 15 kc/s in four overlapping bands, namely 15-160, 140-375, 350-950 and 900-1990 kc/s.

Intermediate Frequencies:-

1st - 2-4 Mc/s, variable.
2nd - 455 kc/s.
S.S.B. (When optional s.s.b. unit fitted) - 110 kc/s.

Frequency Control:-

Continuously variable with direct and 80:1 reduction drives.

Resetting Accuracy:-

Better than 500 c/s throughout the range.

Sensitivity:-

For an input signal of 2 microvolts modulated at 400 c/s to a depth of 30 %, with the i.f. bandwidth set to 6 kc/s, the signal/noise ratio is

not less than 12 db up to 20 Mc/s,
not less than 10 db from 20 to 25 Mc/s,
not less than 8 db from 25 to 30 Mc/s.

For a 1 microvolt c.w. signal, the signal/noise ratio is better than 12 db throughout the frequency range.

Noise Factor:-

3-8 db with b.f.o. off.

Selectivity:-

Choice of four bandwidths, of 300 c/s, 1 kc/s, 6 kc/s and 12 kc/s at 6 db attenuation, a crystal filter being employed for the two narrowest bandwidths.

Attenuation	Switch Position/Bandwidth 300 c/s	1 kc/s	5 kc/s	12 kc/s
6 db	280-320 c/s	930-1070 c/s	4 5 kc/s	4 10 kc/s
30 db	4 5 kc/s	4 7 kc/s	4 14 kc/s	4 24 kc/s
50 db			4 20 kc/s	4 29 kc/s

Spurious Responses:-

Image Rejection Ratio - greater than 57 db.
1st I.F. Breakthrough Rejection Ratio - greater than 60 db.
2nd I.F. Breakthrough Rejection Ratio - greater than 76 db.
Self generated whistles - less than 1 microvolt effective aerial input.

A.G.C.:-

Amplified and delayed with two time constants:

(i) Short - 0.2 sec charge, 0.2 sec discharge.
(ii) Long - 0.2 sec charge, 1.0 sec discharge.

Not more than 3 db change in output level for 100 db change in input above the 1 microvolt level.

A.F. Response:-

Within 6 db from 20 to 6000 c/s relative to 1000 c/s, on the 12 kc/s bandwidth with audio filters out.

Overall Distortion:-

Not more than 4% harmonic distortion at 1.5 watts audio output for a signal modulated at 400 c/s to a depth of 30% with audio filters out.

Signal Source Impedance:

Receiver - 75 ohms unbalanced.
Low frequency adaptor (LFA.10) - high impedance.

Audio Output:-

2 watts maximum into 3 ohms;
1 mW into headphones of 600 ohms nominal impedance;
10 mW maximum into 600 ohms line.

Noise Level in Audio Stages:-

Better than 55 db below 1 watt output on d.s.b. operation.
Better than 40 db below 1 watt output on s.s.b. operation.

Noise Limiter:-

Series/shunt type, which can be switched in or out.

B.F.O.:-

Variable over ±8 kc/s.

Other facilities:-

I.F. Output (0.5 volt across 80 ohms at 455 kc/s independent of b.f.o.).
A.G.C. voltage output.
Selection of 1 kc/s or Low Pass audio filters.
'S' meter with db scale.
Optional 500 kc/s harmonic crystal calibrator.
Optional s.s.b. unit (110 kc/s i.f.).
Optional low frequency adaptor unit (LFA.10).

Valve Complement:-

Function and Circuit Ref.	Qty.	British	American	Inter-Services
Basic R.145				
R.F. and i.f. amplifiers (V1,V5,V6)	3	EF93	6BA6	CV454
Crystal oscillator/multiplier (V15)	1	E180F	6688	CV3998
Variable frequency oscillator (V16)	1	EF91	6AM6	CV138
Mixers (V2,V3,V4)	3	ECH81	6AJ8	CV2128
I.F. buffer amplifier (V17)	1	EF91	6AM6	CV138
A.G.C. det. and d.c. amplifier (V18)	1	EBC90	6AT6	CV452
Signal detector/a.g.c. hold-off diode(V7)	1	EB91	6AL5	CV140
Beat frequency oscillator (V8)	1	ECC81	12AT7	CV455
A.F. voltage amplifier (V13)	1	EF91	6AM6	CV138
A.F. output (V14)	1	EL90	6AQ5	CV1862
Rectifiers (V22,V23)	2	EZ90	6X4	CV493
Stabiliser (V24)	1	150C4	0A2	CV1832
Optional S.S.B. Unit				
Oscillator (V9)	1	ECC82	12AU7	CV491
Mixer (V10)	1	EF91	6AM6	CV138
Amplifier (V11)	1	EF93	6BA6	CV454
Carrier amplifier (V20)	1	EF91	6AM6	CV138
Carrier limiter (V21)	1	EF91	6AM6	CV138
Detector (V12)	1	EB91	6AL5	CV140
Optional Crystal Calibrator				
2.5 Mc/s oscillator/500 kc/s amplifier (V25)	1	ECC81	12AT7	CV455
2 Mc/s amplifier/output shaper (V26)	1	ECC81	12AT7	CV455

Controls:-

Frequency Band selector (SWG, SWP, and turret).
Direct drive and slow motion Tuning controls (C3, C9, C23, C17, C110).
Selectivity switch (SWA)
A.F. Gain control (R57).
R.F. Gain control (R90).
B.F.O. On/Off switch (SWC)
B.F.O. Frequency control (C50).
A.G.C. switch (SWL).
Aerial Trimmer control (C1).
Noise Limiter On/Off switch (SWB).
A.F. Filter switch (SWF).
Meter switch (SWM).
Off/Stand By/On switch (SWH, SWK).

When S.S.B. Unit fitted:-

Sideband selector (SWD).
Selectivity switch incorporates S.S.B. position (max. clockwise).

When Crystal Calibrator fitted:-

Xtal. Cal. On/Off switch (SWE).

Connections (on rear of chassis):-

3-pin mains plug (PL1).
Coaxial aerial socket (SK1).
Coaxial I.F. Output socket (SK2).
600 ohm Line Level Output terminal
3 ohm Audio Output terminals.
A.G.C. terminals.
600 ohm Line Level Output jack socket.

Power Supply:-

100-125 or 200-250 volts, 40-60 c/s.

Power Consumption:-

100 watts, approx.
Plus approx. 16 watts with s.s.b. unit on.
Plus approx. 10 watts with crystal calibrator on.
Plus approx. 11 watts with LFA.10 on.

Dimensions and Weights:-

Unit	Height	Width	Depth	Weight
Basic Receiver alone in Cabinet for Desk Mounting	13¼ in (34 cm)	19½ in (50 cm)	20½ in (52 cm)	107 lb (48.5 kg)
Basic Receiver with LFA.10 in Cabinet for Desk Mounting	16¾ in (43 cm)	19½ in (50 cm)	20½ in (52 cm)	116 lb (52.6 kg)
Basic Receiver with Dust Cover for Rack Mounting	10½ in (27 cm)	19 in (48 cm)	18 in (46 cm)	82 lb (37.2 kg)
LFA.10 with Dust Cover for Rack Mounting	3½ in (9 cm)	19 in (48 cm)	9 in (23 cm)	8¼ lb (3.7 kg)
S.S.B. Unit	(Fits inside receiver)			3½ lb (1.6 kg)
Crystal Calibrator	(Fits inside receiver)			1 lb (0.45 kg)

3.0

TECHNICAL DESCRIPTION

3.1 Frequency Band Switching

The coils and capacitors forming the aerial, r.f. and crystal oscillator tuned circuits for each of the 14 bands are carried on a rotary turret. The schematic diagram for each of these turret circuits is given on Sheet 1A of Drawing No. WDA/4119/L.

In each case the aerial and r.f. tuned circuits are located on a turret position three positions removed from the crystal oscillator anode circuit (e.g. for band 2, as depicted in the main circuit diagram, the aerial and r.f. tuned circuits are associated with the crystal oscillator anode circuit for band 5). This arrangement is necessary because the fixed contacts (10-13) for the crystal oscillator anode circuit are carried on a sub-chassis mounted beneath the turret assembly, whilst the fixed contacts (1-9) for the aerial and r.f. circuits are carried on a sub-chassis located at the side of the turret.

On all bands except No. 1, the h.t. supply to the crystal oscillator is picked up at contact 6 of the turret and fed to contact 11. On the main circuit diagram this h.t. switching contact is designated "6A" to distinguish it from contact 6 for the r.f. circuits.

3.2 R.F. Amplifier

The aerial transformer appropriate to the band in use is switched between the grid of valve V1 and earth by turret contacts 1, 2, 3 and 4. Aerial tuning is provided by variable capacitor C3 which is one of five ganged capacitors driven by the main tuning control. The stage is coupled to the grid of the succeeding mixer stage, the tuned circuits for the band in use being selected by turret contacts 5, 6, 7, 8 and 9.

3.3 First Mixer

Two triode-heptode type valves (V2 and V3) are connected as a balanced mixer with a push-pull output circuit connected to the anodes of the heptode sections. The signal input is applied to one valve (V2) only, the grid circuit of which is tuned by ganged variable capacitor C9. The heterodyne voltage, however, is injected into both valves with similar phase so that the output from the stage will contain no component at the heterodyne frequency. On bands 3 to 14 balance is achieved by varying the screen voltage applied to V2 and V3 by means of R134. On band 2 the stage is balanced on the second harmonic and not the

fundamental of the heterodyne frequency by means of R11 which is automatically brought into circuit by switch SWP ganged with the Frequency Band selector.

Heterodyne voltage is generated by a pentode crystal oscillator (V15). Seven crystals are required to cover the frequency range of the receiver, the appropriate crystal and associated capacitors for any given band being selected by switch-banks SWGa and SWGb which are ganged with the Frequency Band selector. The tuned anode circuit is selected by turret contacts 11, 12 and 13 and for certain bands functions as a frequency multiplier. The following table gives the fundamental frequencies of the crystals employed on all bands together with the multiplication factors and output frequencies.

Band	Range Mc/s	Crystal Frequency Mc/s	Multiplication Factor	Output Frequency Mc/s
1	2-4	-	-	-
2	4-6	2	x1	2
3	6-8	4	x1	4
4	8-10	6	x1	6
5	10-12	4	x2	8
6	12-14	10	x1	10
7	14-16	6	x2	12
8	16-18	14	x1	14
9	18-20	4	x4	16
10	20-22	6	x3	18
11	22-24	10	x2	20
12	24-26	11	x2	22
13	26-28	6	x4	24
14	28-30	13	x2	26

On band 1 the oscillator is inoperative; the mixer stage then functions purely as a signal frequency amplifier.

Output at the first and variable intermediate frequency of between 2 and 4 Mc/s is coupled to the second mixer, V4, via a pair of band-pass circuits (T1 and L1) tuned by variable capacitors C23 and C17 ganged with the main tuning control.

3.4 Second Mixer and I.F. Amplifiers

Heterodyne voltage is derived from a variable frequency Hartley oscillator (V16). The oscillator is tuned over the frequency range 2.455-4.455 Mc/s by variable capacitor C110 which is ganged with the main tuning control. Output is taken from a tapping on the tank coil (L12) and applied to the grid of the triode section of V4 which is employed as a buffer amplifier. Fixed bias is applied

from the 100 volts negative line via a potential divider formed by resistors R156 and R157. The signal and heterodyne voltages are mixed in the heptode section of V4 which feeds i.f. transformer T2 tuned to the second (fixed) intermediate frequency of 455 kc/s.

Two stages of i.f. amplification are provided by valves V5 and V6 with choice of alternative bandwidths of 300 c/s, 1 kc/s, 6 kc/s and 12 kc/s afforded by the Selectivity switch SWA. These degrees of selectivity are obtained by the use of tertiary windings on i.f. transformers T2 and T3 and, in the case of the two narrowest bandwidths, by the use of a quartz crystal (QC1) gate.

In receivers fitted with the optional s.s.b. unit, a fifth position, designated S.S.B., is incorporated in the Selectivity switch. In this position switch-bank SWAg removes from circuit the d.s.b. detector V7a and bank SWAj switches in the s.s.b. oscillator V9.

3.5 Intermediate Frequency Output Facility

A third i.f. amplifier (V17) is fed from the screen of the second i.f. amplifier (V6) to provide an output at 455 kc/s independent of the beat frequency oscillations which are injected into the cathode circuit of V7a.

This output is available at low impedance at socket SK2 and is obtained by tapping down on the secondary winding of transformer T10.

3.6 A.G.C. Circuits

A 455 kc/s signal from the secondary winding of transformer T10 is applied to the right-hand diode of V18. The negative bias potential developed by rectification across load resistor R95 in the presence of a signal is applied to the grid of V18 as a control voltage.

The cathode and anode resistors of the triode section of V18 are so chosen that, in the no-signal condition, when the valve is passing maximum anode current, the potential difference across resistors R93 and R94 is sufficient to offset the 100 volts negative bias and make the cathode positive with respect to the earth line. In this condition the a.g.c. diodes will not conduct and no automatic bias is applied to the controlled stages. With a signal input of sufficient amplitude to operato the a.g.c. system the anode current of the triode is reduced by the negative control voltage applied to its grid and the potential across resistors R93 and R94 is thereby caused to fall. As a result the cathode of V18 takes up a negative potential with respect to earth and the a.g.c. diodes (V7b and right-hand diode of V18) conduct to develop an automatic gain control voltage across load resistors R89 and R2 respectively.

A greater delay in the application of a.g.c. is employed on the r.f. stages than on the second frequency changing and first 455 kc/s i.f. amplifying stages. Manual gain control of these stages is afforded by the R.F. Gain control potentiometer R90 which applies a bias potential from the 100 volts negative line.

Switch SWL has three positions to provide choice of two time constants or to enable the a.g.c. system to be rendered inoperative.

3.7 D.S.B. Detector

The d.s.b. detector employs a single diode (V7a) switched into circuit by banks SWAg and SWAh of the Selectivity switch in its first four (bandwidth) positions. The diode is loaded by resistors R29 and R30 and its output is capacitively coupled to the a.f. voltage amplifier via switch-bank SWAh, C200 and the A.F. Gain control R57. A series/shunt limiter employing two germanium diodes is provided for the suppression of high amplitude impulse noise, which circuit can be rendered inoperative by switch SWB.

3.8 Beat Frequency Oscillator

Heterodyne voltage for the reception of c.w. signals is derived from a Hartley Oscillator (right-hand section of V8), the frequency of which can be swung $\pm$8 kc/s off the centre frequency by adjustment of C50. Its output is coupled via a cathode follower buffer stage (left-hand section of V8) into the detector circuit (V7a). The oscillator is brought into operation by closing the B.F.O. On/Off switch SWC to apply the 150 volts h.t. supply to the anodes of V8.

3.9 A.F. Voltage Amplifier and Output Stage

Audio frequency voltage amplification is performed by V13 which drives the power output valve V14. Coupling between these two stages is normally made via a low-pass filter, having a cut-off frequency of approximately 3 kc/s, or via a 1 kc/s filter circuit, as selected by switch SWF. For the reception of broadcast transmissions these filters can be removed from circuit by switch SWF in which case overall negative feedback is applied via switch-bank SWFb. The output transformer T8 has two secondary windings to provide a loudspeaker output at 3 ohms impedance and a line level output at 600 ohms impedance. Jack sockets J1 and J2 are also provided for the connection of headphones having a d.c. resistance of 120 ohms (approx. 600 ohms impedance).

3.10 S.S.B. Mixer (In receivers fitted with optional s.s.b. unit)

Heterodyne voltage is generated by either of two independent crystal-controlled oscillators operating at frequencies of 565 and 345 kc/s respectively. The output of the operative oscillator, as selected by the Sideband selector SWD which affords choice of the upper or lower sideband, is mixed with the 455 kc/s output from i.f. transformer T4 in the control-grid circuit of the s.s.b. mixer valve, V10. The h.t. voltage to the anodes of V9 and the i.f. input to V10 are applied by switch-banks SWAj and SWAg respectively in the fifth (S.S.B.) position of the Selectivity switch SWA.

3.11 Sideband Amplifier (In receivers fitted with optional s.s.b. unit)

The sideband amplifier (V11) is coupled to the s.s.b. mixer (V10) by a tuned band-pass circuit (T5, T6) transmitting frequencies in the band 110.5-112.8 kc/s.

3.12 Carrier Amplifier and Limiter (In receivers fitted with optional s.s.b. unit)

The carrier, having a frequency of 110 kc/s, is separated from the sideband by means of a crystal resonator QC11 and applied to valve V20 which functions as a carrier amplifier. The output from this stage is passed to the carrier limiter V21, whence it is fed at constant level to the s.s.b. detector (as a reconstituted carrier).

3.13 S.S.B. Detector (In receivers fitted with optional s.s.b. unit)

The output of the sideband amplifier is applied to the balanced demodulator stage (V12) via the secondary winding of r.f. transformer T7. The reconstituted carrier is fed to the detector at constant level, some 17 db above the peak sideband level, via the centre-tap on T7. Audio frequency voltages are developed across the load resistors R49, R50 and routed to the a.f. stages via the fifth (S.S.B.) position of switch-bank SWAh.

3.14 Crystal Calibrator (Optional)

An optional built-in crystal calibrator, comprising two double-triode valves type ECC81 (V25 and V26) operating as a crystal-controlled 500 kc/s harmonic generator, provides a facility for checking the accuracy of the tuning scale calibration on marker points at 500 kc/s intervals. A 2.5 Mc/s crystal is employed in a reference oscillator stage V25a feeding an amplifier V25b, having its anode circuit tuned to 500 kc/s, the output from which is fed to both V26a and V26b. The anode circuit of V26a is tuned to 2 Mc/s and its output is fed back to the grid circuit of V25b to beat with the 2.5 Mc/s from the crystal oscillator to maintain the 500 kc/s drive. V26b is an output shaper to ensure a waveform having a

high harmonic content. The output from the crystal calibrator is fed into the aerial circuit via C264 and the receiver responds to the various 500 kc/s harmonics.

3.15 Power Supply System

The mainstransformer T9 is provided with primary windings capable of series or parallel connection for operation from a.c. mains inputs of 200-250 volts or 100-125 volts, 40-60 c/s.

The main h.t. supply of 220 volts is derived from a conventional full-wave rectifying circuit, employing high-vacuum valves (V22, V23), feeding into a capacitor input smoothing filter. The 150 volts h.t. line to the first (V15), second (V16) and s.s.b. (V9) oscillators and the b.f.o. (V8) is stabilised by V24.

The output from a tapping on the h.t. winding of transformer T9 is applied to a half-wave selenium rectifier (W4) to provide a negative bias potential of 100 volts for the a.g.c. and r.f. gain control systems.

The two dial lamps (LP1, LP2) are energised from the 6.3 volts a.c. heater supply.

The two two-pole switches SWH and SWK are mechanically linked and operated by the panel-mounted Off/Stand By/On control. In the STAND BY condition SWH closes to apply the heater voltages to the h.t. rectifying and receiver valves whilst in the ON condition SWK closes to make available the h.t. and bias voltages.

3.16 METERING

Comprehensive valve current monitoring facilities are provided by the 0-1 mA meter M1 in conjunction with the two-pole Meter switch SWM. In the S-METER position of this switch the meter is included in a bridge type S-meter circuit to provide an arbitr ry indication of signal strength. Variable resistor R138, forming part of a voltage-dividing network connected across the main h.t. supply, enables the bridge to be balanced for zero meter current.

The monitoring facilities afforded are tabulated on page 15. The typical readings shown were obtained with a receiver tuned to 3 Mc/s, with the R.F. Gain set to maximum, s.s.b. unit on, b.f.o. off, and the aerial disconnected.

	Switch SWM Position Marking	Valve Function	Quantity Measured	Full Scale Deflection	Typical Reading Indicated
	V1	R.F. amplifier	Ia	30 mA	9 mA
	V2,V3	First mixer, heptode section	Ia+Is	30 mA	20 mA
	V4	Second mixer, " "	Ia	10 mA	3.5 mA
	S-METER	First i.f. amplifier	V5Ia+Is	100 db	(S-Meter)
	V6	Second i.f. amplifier	Ia+Is	10 mA	7 mA
	V14	A.F. power output	Ia+Is	100 mA	30 ma
	V15	Crystal oscillator	Ia	30 mA	9 mA
	V16	Variable frequency oscillator	Ia+Is	10 mA	3 mA
*	V10	S.S.B. mixer	Ia+Is	10 mA	4 mA
*	V20	Carrier amplifier	Ia+Is	10 mA	7.5 mA
*	S.S.B. LIM.	Carrier limiter	V21Ia+Is	10 mA	6 mA
	H.T.	-	Line volts	300 V	210 V

* On receivers fitted with optional s.s.b. unit.

The "H.T." reading will be increased by approximately 10 volts when the Selectivity switch is switched to a bandwidth position instead of to S.S.B.

INSTALLATION AND INITIAL ADJUSTMENTS

Before attempting to operate the receiver check that the mains transformer tappings and resistor links are set to conform with the available mains supply voltage. Check that the correct fuses (1.5 amp for 200-250 volts or 3 amp for 100-125 volts) are fitted and ensure that an efficient earth connection is made via the three-pin mains supply socket provided. Also check that the aerial, loudspeaker and headphones conform to the requirements given in Sections 4.2, 4.3 and 4.4 below.

The turret locating-spring tension may be adjusted to suit individual operators' preference.

4.1 Mains Voltage Adjustments

The mains transformer is provided with a split primary winding capable of series or parallel connection to accommodate a.c. mains inputs of 100-125 or 200-250 volts, 40-60 c/s. The adjustment is carried out by means of link-wires soldered across the appropriate terminals of the transformer as indicated in the following table.

Mains Voltage	Interconnection Links				Input Connections			
100	0	to 0	and 100	to 100	0	and 100		
105	5	" 5	" 100	" 100	5	" 100		
110	0	" 0	" 110	" 110	0	" 110		
115	5	" 5	" 110	" 110	5	" 110		
120	0	" 0	" 120	" 120	0	" 120		
125	5	" 5	" 120	" 120	5	" 120		
200	0	upper *	to 100	lower *	0	lower *	" 100	upper *
205	5	"	" 100	"	0	"	" 100	"
210	0	"	" 100	"	0	"	" 110	"
215	5	"	" 100	"	0	"	" 110	"
220	0	"	" 100	"	0	"	" 120	"
225	5	"	" 100	"	0	"	" 120	"
230	0	"	" 120	"	0	"	" 110	"
235	5	"	" 120	"	0	"	" 110	"
240	0	"	" 120	"	0	"	" 120	"
245	5	"	" 120	"	0	"	" 120	"
250	5	"	" 120	"	5	"	" 120	"

* As viewed with the engraving on the tag panel the right way up for reading.

The voltage dropping resistors R98 and R99 must be connected in parallel for 100-125 volts working by linking tag points A to B and C to D and in series for 200-250 volts working by linking tag points B to C.

4.2 Signal Source Impedance

The receiver is designed for use with an aerial having a feed impedance of 75 ohms, with a coaxial cable lead-in.

4.3 Loudspeaker

Terminals are provided on the moulded terminal strip at the rear of the chassis, for the connection of a loudspeaker having a speech coil impedance of 3 ohms.

NOTE: The receiver must never be operated with the 3 ohm output unloaded, otherwise breakdown of the EL90 output valve (V14) or its holder may result.

4.4 Headphones

Two jack sockets (J1 and J2), marked PHONES, are fitted on the front panel of the receiver for the connection of headphones having a d.c. resistance of 120 ohms (approx. 600 ohms impedance). The use of headphones having a different characteristic will result in a deterioration of performance.

4.5 600 ohm Line Output

A.F. output is also provided at 600 ohms impedance for connection to a normal transmission line system, via jack socket J3 or the two terminals, which are appropriately identified, on the moulded terminal strip at the rear of the chassis.

4.6 I.F. Output Facility

The 455 kc/s i.f. output of approx. 0.5 volt is available at low impedance via socket SK2 at the rear of the chassis to feed any ancillary apparatus with which the receiver may be used provided that the impedance is matched to 75 ohms. If this facility is not used socket SK2 must be loaded with a 75 ohm resistor.

4.7 S-Meter Adjustment

The S-Meter zero adjustment potentiometer (R138) is located immediately behind the meter and is accessible by lifting the lid of the cabinet. It must be adjusted, with no aerial connected, a.g.c. on, and r.f. gain at maximum, for zero reading on the meter.

5.0

OPERATION

All operating controls are carried on the front panel of the receiver. Their functions and operational applications are described below.

5.1 Off/Stand By/On Switch

Applies the mains supply to the receiver. At STAND BY the valve heaters are on and the dial is illuminated. The receiver can then be instantly brought into operation by advancing the switch to ON.

5.2 Frequency Band Selector

Rotates the coil turret to cover the frequency range 2-30 Mc/s in 14 positions, each giving coverage of a band 2 Mc/s in width. The limiting and centre frequencies of the band selected appear in windows let into the main tuning dial. It will be noted that on certain bands some of the figures are printed in red, viz. "4"-"6", 6-"8", 10-"12" and 18-"20". (The figures shown in quotes are printed in red). No attempt should be made to receive a signal on any band in which the signal frequency is within 20 kc/s of one marked in red. For example, assuming that it is desired tc receive a signal on a carrier frequency between 7.98 and 8.02 Mc/s, then the Frequency Band selector must be set to band 4 (8-10 Mc/s) and not to band 3 (6-"8" Mc/s). Failure to observe this precaution will be evidenced by interference from the first oscillator.

5.3 Main Tuning Controls

Two controls are arranged concentrically to provide direct and 80:1 reduction drives. The main tuning scale is calibrated in 0.1 Mc/s divisions and the auxiliary scale in kc/s ensuring easy tuning and accurate resetting to within 500 c/s. A secondary tuning scale on the main dial, printed in green, is calibrated from 0 to 2 Mc/s, also in 0.1 Mc/s divisions, for use in conjunction with the Low Frequency Adaptor Type LFA.10.

5.4 A.G.C. Switch

The use of a.g.c. will be determined chiefly by the prevailing conditions. It is given as a general rule, however, that a.g.c. should always be used for telephony reception except where the wanted signal is weak and is in danger of being lost because the gain has been reduced by the action of strong interference on the a.g.c. system.

The SHORT position is provded for use on telephony service whilst the LONG position gives an increased recovery time-constant for use when receiving c.w. telegraphy transmissions.

5.5 B.F.O. On/Off Switch

This is a simple on/off switch controlling the h.t. supply to the beat frequency oscillator. Set to ON for the reception of c.w. signals.

5.6 B.F.O. Frequency Control

This control determines the pitch of a received c.w. signal by varying the frequency of oscillation of the b.f.o. Refer also to the note following Section 5.8.

5.7 A.F. Filter Switch

Introduces a 1 kc/s filter or a 3 kc/s low-pass filter as selected. This control may be set to OUT for the reception of broadcast transmissions in the absence of interference.

5.8 Selectivity Switch

This switch controls the selectivity of the receiver by varying the i.f. bandwidth in four steps, as follows:-

(a) "300 c/s" - Highest possible selectivity. Used for the reception of c.w. telegraphy signals in the presence of adjacent channel interference.

(b) "1 kc/s" - Reduced selectivity. Used for searching and the reception of telegraphy signals.

(c) "6 kc/s" - Further reduced selectivity. Gives best intelligibility of telephony. Not recommended for the reception of c.w. signals except in exceptional circumstances. Refer also to the note at the end of this sub-section.

(d) "12 kc/s" - Used only for the reception of strong broadcast transmissions where there is no adjacent channel interference.

On receivers fitted with the optional s.s.b. unit, a fifth position on this switch, designated S.S.B., permits reception of either sideband of a double-sideband signal and is intended to provide improved reception of d.s.b. signals in the presence of adjacent channel interference and/or selective fading. To make use of this facility, set the Meter switch (see Section 3.16) to the S.S.B. LIM. position and select in turn the upper and lower side-band with the Sideband selector (see Section 5.9). In each position of the Sideband selector tune carefully for a dip in the

meter reading and leave the switch in that position (U.S.B. or L.S.B.) which gives the better result.

NOTE: The narrowest pass-band can only be employed where the frequency of the transmitted signal is reasonably constant. When receiving a c.w. transmission on the broader pass-bands and tuning the receiver through zero beat it will be found that the signal is equally strong on both sides but on the narrow pass-band (300 c/s) one side will give a stronger note than the other. In some circumstances the weaker signal may even be inaudible. The receiver must always be tuned to the stronger of the two. Should a c.w. signal be tuned in on a wide pass-band and the wrong side of zero beat selected, the signal will probably be lost if the operator decides to change to a narrow pass-band. Because of this and the difficulty of identifying the stronger signal it is recommended that the 6 kc/s pass-band should not normally be used when tuning in a c.w. signal.

5.9 Sideband Selector (On receivers fitted with optional s.s.b. unit)

Permits selection of the upper or lower sideband when the Selectivity switch (see Section 5.8) is set to S.S.B.

5.10 R.F. and A.F. Gain Controls

For telegraphy reception it is better to have the A.F. Gain control fully advanced and to reduce the volume to a suitable level by adjustment of the R.F. Gain control after the station has been tuned in.

5.11 Meter Switch

In addition to switching the built-in meter to monitor various valve currents (see Section 3.16), this switch has an S-METER position enabling the meter to be used as a tuning indicator. On receivers fitted with the optional s.s.b. unit there is also an S.S.B. LIM. position providing an additional accurate tuning facility (see Section 5.8). When operating the receiver this switch may be left in the S-METER position. An indication of signal strength is then given on the db scale of the meter.

NOTE: The S-Meter is operative only when the R.F. Gain control is at maximum and the a.g.c. is switched in.

5.12 Aerial Trimmer

This should always be adjusted for maximum sensitivity.

5.13 Noise Limiter On/Off Switch

Provided for the suppression of high amplitude impulse noise. Can be used when receiving either c.w. or telephony transmissions.

5.14 Xtal. Cal. On/Off Switch (On receivers fitted with optional crystal calibrator)

Controls the h.t. supply to the optional built-in crystal calibrator circuit which can be used to check the accuracy of the receiver tuning scale in the following manner:-

(a) Set the Meter switch to the S-METER position, the A.G.C. switch to either SHORT or LONG, and the Selectivity switch to the 300 c/s position.

(b) Accurately tune the receiver to the nearest harmonic of the crystal calibrator (multiple of 500 kc/s) by observing the S-Meter for maximum deflection.

(c) Insert screwdriver in the Cal. Adj. aperture and move the cursor to ensure that the auxiliary tuning scale reads exactly zero.

NOTE: No attempt should be made to perform any calibration check or adjustment until the receiver has had time to thoroughly warm up.

6.0

MAINTENANCE

6.1 Accessibility of Valves

V15 is located on the underside of the chassis beneath the turret assembly and is readily accessible.

V16 is mounted horizontally in the centre underside of the chassis and access to this valve is obtained by removing the plate, engraved with the crystal and trimming capacitor locations, under the chassis.

In receivers fitted with the optional s.s.b. unit, the accessibility of V5, 6, 7, 17 and 18, is achieved by lifting up the s.s.b. chassis, which is mounted on its side above the i.f. strip, after loosening off the locking screw and turning the assembly up on its hinge from the horizontal position until the locating spigot engages to hold it in the vertical position. This also facilitates access to valves V10, 11, 12, 20 and 21, which are mounted on the s.s.b. chassis. Before returning the s.s.b. chassis to the horizontal position it must be moved back on its hinge bearings against the spring in order to disengage the locating spigot.

All other valves are reasonably accessible.

6.2 Lubrication

The turret bearings and crystal switch driving chain should be lubricated very occasionally with a light oil (approx. s.a.e. 20).

No other lubrication is advisable.

The turret contacts are rhodium plated and should not require any cleaning or lubrication as they are virtually untarnishable.

6.3 Miscellaneous

The accessibility of components on the tag strip under the i.f. chassis may be facilitated by removing the aerial trimmer shaft which may be readily accomplished by withdrawing it through the front panel after first slackening off the grub screws in the actuating bevel gear wheel and the two locating collars.

The spring tension for the turret locating mechanism is adjustable by altering the position of the stop-nut on the tension spring retaining screw.

Note that the pointer for the auxiliary (kc/s) scale moves as well as the actual scale. Do not assume that adjustment is necessary because the pointer is over to one side of the window, as movement of the tuning control will probably cause it to return to a more central position.

Should the tuning drive clutch mechanism show a tendency to slip, indicated by an apparent sticking of the auxiliary scale, this can be corrected as follows. The clutch is located between the dial drive mechanism and the variable capacitors, immediately in front of the flexible coupling. Two 0 BA nuts with plain washers are provided at the rear ends of the clutch springs for adjusting the tension. These should be tightened about one sixth of a turn at a time until no slip is apparent. Each spring should be adjusted by an equal amount to avoid uneven pressure on the clutch plates.

6.4 Test Data

Owing to the tolerancesof components, meter errors, etc., only approximate test figures can be given, but these will serve as a useful guide to fault finding and servicing.

6.4.1 Insulation Test

The insulation resistance between the mains input circuit and chassis, measured with a 500 volt megger, should be not less than 100 M ohms.

6.4.2 D.C. Voltage and Current Measurements

Main h.t. voltages:	210 to 220 volts
Stabilised h.t. voltage:	145 to 155 volts
Negative h.t. voltage:	-100 to -105 volts
Negative voltage across W6:	- 4.5 to - 6 volts

A comprehensive Valve Voltage analysis is given in the Appendix.

Typical readings obtained on the built-in service meter are given in Section 3.16.

6.4.3 A.F. Measurements

(a) Sensitivities

The r.m.s. input voltage at 1 kc/s, injected at the junction of SWAh and C200, to produce 1 watt of audio output into a 3 ohm load, should be 0.2 to 0.3 volt with the A.F. Filter switch in the 1 kc/s or the L.P. position, or 0.15 to 0.25 volt with the a.f. filters out.

(b) Hum and Noise Level

With the R.F. Gain control at minimum, the hum and noise level on the 6 kc/s bandwidth should be not less than 55 db below 1 watt on d.s.b. working or not less than 40 db below 1 watt on s.s.b. working (on receivers fitted with the optional s.s.b. unit).

6.4.4 Crystal Oscillator Measurements

The error of the oscillator frequency at the mixer grid, on frequency bands 2 to 14, should be not greater than 100 c/s.

The balanced mixer drive current in R8 should be between 150 and 275 microamps.

6.4.5 B.F.O. Measurements

The limits of the b.f.o. frequency swing about centre zero should be ±8 to ±9 kc/s at dial settings of ±8 kc/s respectively.

The current in R30 due to the b.f.o. drive should be not less than 50 microamps over the full swing of the B.F.O. Frequency control.

When the B.F.O. Frequency control is set to centre zero, the b.f.o. frequency should be 455 kc/s ±100 c/s.

6.4.6 V.F.O. Measurements

The resetting accuracy should be better than 500 c/s throughout the frequency range.

The calibration accuracy should be within 500 c/s, with the exception of the last 100 kc/s at the h.f. end of each band, where an error of 1 kc/s is permissible.

The torque required to turn the large (direct drive) tuning knob should not be greater than 50 ounce inches.

There should be no lost motion between the kc/s dial and the slow motion (small) tuning knob.

6.4.7 2nd I.F. Measurements

(a) Sensitivity

With the a.g.c. off, b.f.o. off, and R.F. Gain control set to maximum, an unmodulated signal from a low impedance shource at a nominal frequency of 455 kc/s should be injected via a 0.1 microfarad capacitor to V4 signal grid.

On the 300 c/s and 1 kc/s bandwidth positions of the Selectivity switch, the signal frequency should be varied slightly until a peak of diode current is developed in R30. The signal level should be less than 150 microvolts for 50 microamps peak diode current.

On the 6 kc/s and 12 kc/s bandwidth positions, the signal frequency must be kept at 455 kc/s ±50 c/s and the signal level should be less than 120 microvolts and 350 microvolts respectively for 50 microamps of diode current.

(b) Selectivity

There should be no minor humps in the 300 c/s and 1 kc/s crystal response curves between the 30 db and 50 db attenuation figures.

6.4.8 1st I.F. Sensitivity

With the Frequency Band selector set to Band 1 and the Selectivity switch to the 6 kc/s bandwidth position, an unmodulated signal should be injected into V2 signal grid at 2, 2.133, 2.5, 3, 3.5, 3.867, and 4 Mc/s in turn. The input level for 50 microamps diode current in R30 should be not greater than 10 microvolts and the ratio between maximum and minimum sensitivity figures should be not greater than 3 db.

6.5 Alignment Instructions

The receiver is correctly aligned before leaving the factory and adjustment should not be necessary unless valve changes or the replacement of defective components has caused serious misalignment due to variations of characteristics or values within the specified tolerances. Realignment should only be attempted by qualified electronic engineers, to whom the following notes should be helpful.

NOTE: The iron dust core trimmers of inductors are fitted with neoprene anti-vibration rings and do not require any other form of locking or sealing.

Trimming capacitors have an adjacent locking screw which must be loosened before adjustment and re-tightened afterwards.

Transformer and coil connection numbers are shown on the circuit diagram and are similarly marked on the equipment to facilitate the identification of primary and secondary windings, tapping points, etc.

6.5.1 2nd I.F. Alignment

Inject a 455 kc/s signal into V4 grid. With the a.g.c. off and the Selectivity switch set to the 300 c/s bandwidth position, swing the signal generator frequency control slightly for maximum indication on the output meter. Turn the Selectivity switch to the 6 kc/s bandwidth position and trim i.f. transformers T4, T3 and T2 in turn in that order. In each case trim the i.f. transformer secondary for maximum output first, having damped the primary with a 56 k ohm resistor, then transfer this damping resistor to the secondary and trim the primary for maximum output. Trim T10 in a similar manner but using a valve-voltmeter with a 75 ohm resistor in parallel connected to SK2 instead of the output meter.

6.5.2 Crystal Gate Adjustment

(a) 1 kc/s Bandwidth

Set the Selectivity switch to the 1 kc/s bandwidth position. Remove the lead from pin 5 of L2 assembly. Connect a 56 k ohm (±10%) ¼ watt carbon resistor between this lead and chassis. Inject a 451 kc/s signal, at approx. 1 volt level, into V4 grid and adjust C31 for minimum diode current. Replace the 56 k ohm resistor by a 1 k ohm (±10%) ¼ watt carbon resistor and adjust the input frequency for maximum diode meter deflection. Disconnect the 1 k ohm resistor and reconnect the lead to pin 5 of L2. Remove the crystal and tune L2 for maximum diode current. Replace the crystal and readjust C31 for symmetry of the crystal curve at 20 db attenuation level. The sensitivity should be approx. 30 mV for 50 microamps of diode current.

(b) 300 c/s Bandwidth

As for (a) but set the Selectivity switch to the 300 c/s bandwidth position and adjust C240 for 300 c/s ±20 c/s bandwidth at 6 db attenuation. The sensitivity for 50 microamps diode current should be approx. 25 mV and the response curve should be substantially symmetrical.

6.5.3 V.F.O. Adjustment

The adjustment of L12 should not be disturbed unless serious misalignment has occurred. In the event of a change of valve V16 necessitating slight realignment sufficient adjustment should be obtained by tuning C108 for maximum indication on the built-in S-Meter with the receiver main tuning dial set to 4 Mc/s, the Frequency Band selector on the 4-6 Mc/s band, the Selectivity control set to the 300 c/s bandwidth position, the A.G.C. switch set to LONG and the R.F. Gain control to maximum.

With the tuning control set to the high frequency end of its travel (extreme anticlockwise), adjust L21 for minimum V4 anode current as indicated on the built-in service meter with the Meter switch set to the V4 position. This adjustment is not critical.

6.5.4 1st I.F. Alignment

With the receiver tuned to 2.133 Mc/s, tune the iron dust cores of T1 and L1 to a signal of 2.133 Mc/s from the signal generator injected at the aerial terminal, and with the receiver and signal generator tuned to 3.867 Mc/s, tune trimming capacitors C18 and C22, for maximum diode current with the a.g.c. off.

6.5.5 1st Mixer Balancing

With the b.f.o. switched on, adjust R11 for minimum audio output with the receiver tuned to 5.09 Mc/s and adjust R134 for minimum audio output with the receiver tuned to 7.09 Mc/s.

6.5.6 Turret Circuit Alignments

NOTE: A metal screwdriver may be used for trimming all the turret coils provided that the outermost (anticlockwise) of the two possible tuning peaks is obtained.

(a) Aerial Circuits

With the Aerial Trimmer control central, tune the core of the aerial coil on each band for maximum output with the signal generator and receiver tuning set to 2.133 Mc/s for band 1, and 2 Mc/s higher for each other band in turn (i.e. 4.133 Mc/s for band 2, 6.133 Mc/s for band 3, and so on up to 28.133 Mc/s for band 14), the output from the signal generator being injected at the aerial socket.

(b) R.F. Circuits

Tune the cores of the r.f. coils on each band using the same procedure as for (a). Then tune trimming capacitors C181 to 193 inclusive and C198 (one for each band) at 3.867 Mc/s for band 1 and increasing by 2 Mc/s for each band up to 29.867 Mc/s for band 14. Recheck coil and capacitor trimming on the stipulated frequencies as necessary.

(c) Crystal Oscillator Anode Circuits

Adjust the iron dust cores of the coils on each band except band 1 for minimum reading on the built-in service meter with the Meter switch in the V2,V3 position. Note that the coils for bands 7, 9, and 13 have two cores both of which must be adjusted; access to the inner cores may be obtained from inside the turret by removing the cover plates on the opposite sides of the turret. Care should be taken not to mis-align to the wrong harmonic. If in doubt, inject a signal at the required crystal oscillator output frequency into the control grid of V15.

6.5.7 B.F.O. Adjustment

With any signal injected into the aerial socket and the Selectivity switch set to the 300 c/s bandwidth position, tune the receiver for maximum deflection of the S-Meter, set the B.F.O. Frequency control to its central position and, with the b.f.o. switched on, adjust L3 for zero beat, selecting the lower of the two possible positions for L3 core.

6.5.8 S.S.B. Unit Adjustments

(a) S.S.B. Carrier Amplifier and Limiter

Tune in any signal fed into the aerial terminal from the signal generator for a minimum reading of limiter anode current using the built-in service meter with the Meter switch in the S.S.B. LIM. position. Trim L15 and L7 to produce a further reduction. Then connect a microammeter having a full-scale deflection of 50 microamps in series with the earthy end of R49 and with V11 removed adjust C217 until response is symmetrical. (Use a small value of signal - below the limiter operating level).

(b) Sideband Amplifier

Feed a 111.8 kc/s signal into the grid of V10, remove V20 and trim T5, T6 and T7 for maximum reading on the microammeter connected as in (a). First trim the transformer secondary with the primary damped with a

56 k ohm resistor and then transfer the damping resistor to the secondary and trim the primary of each transformer in turn commencing with T7, then T6 and T5 in that order. Now change the input to 109.5 kc/s and adjust L6 for minimum reading on the microammeter.

(c) S.S.B. Oscillator

Determine the resonant frequency of QC11 and adjust L4 and L5 so that the frequency difference between the U.S.B. and L.S.B. positions of the Sideband selector is twice this frequency (approximately 345 and 565 kc/s); e.g. if QC11 resonates at 110.02 kc/s, set the l.s.b. and u.s.b. oscillators to 344.98 and 565.02 kc/s respectively (i.e. 455 ±110.02 kc/s).

6.6 Spares and Replacements

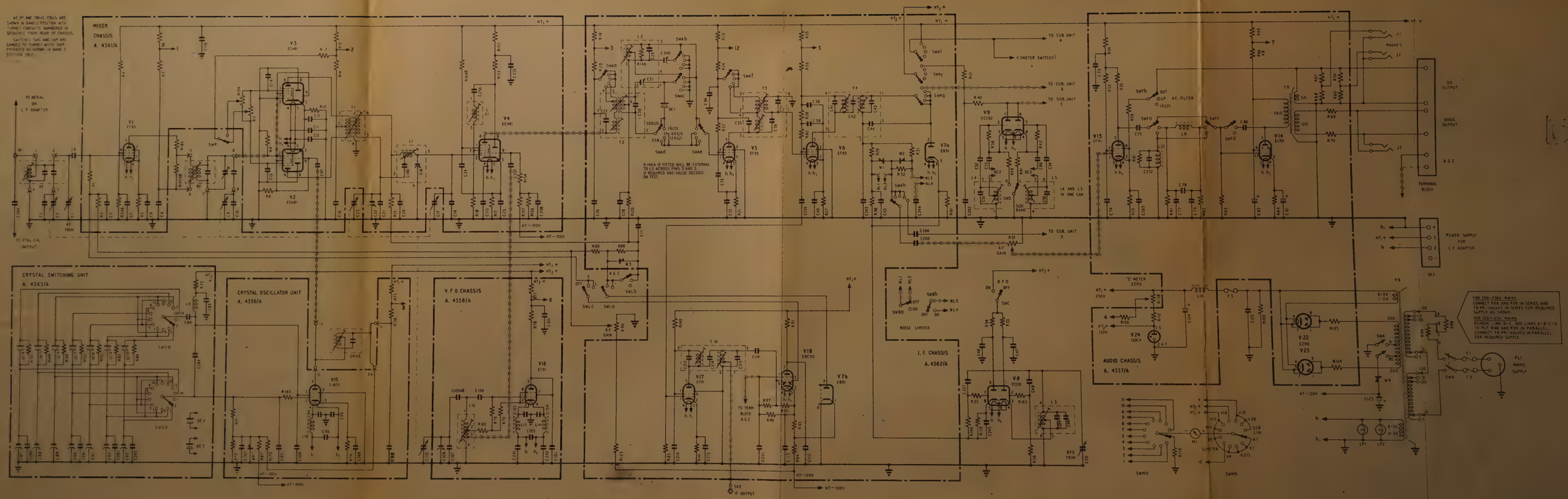
To ensure receiving the correct item, and to expedite delivery when ordering spare and replacement parts, please quote:-

(i) Type number of equipment, as shown on label.

(ii) Serial number of unit.

(iii) Circuit reference, as shown on Circuit Diagram, and full description of item.

Additional or alternative useful information is the number of the Circuit Diagram, or Components List number and sheet number, or as shown in Spares Schedules.

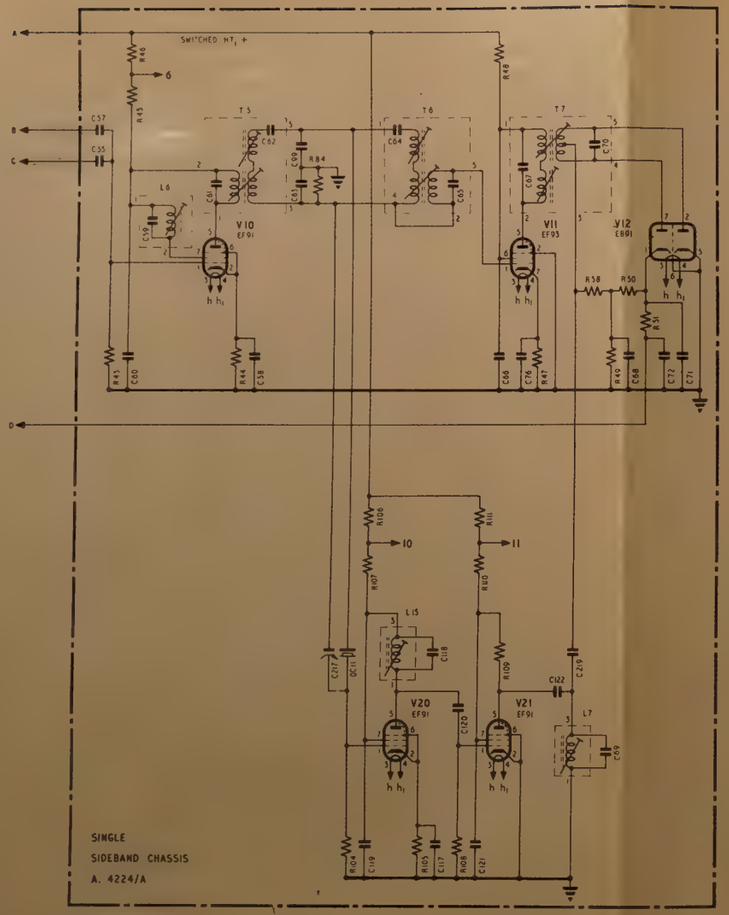


DRAWN F. H. | TRACED M. S. | ENGINEER | APPROVED

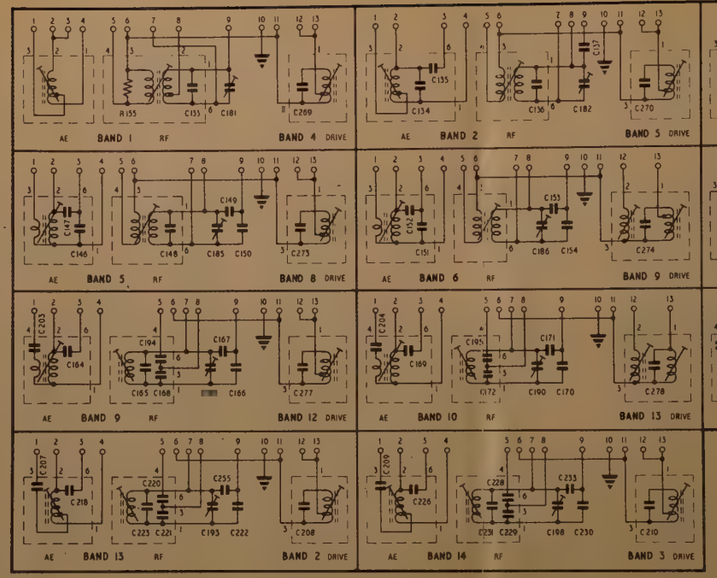
REDIFON LTD. LONDON | TITLE

RECEIVER, TYPE R 145

DWG. No.

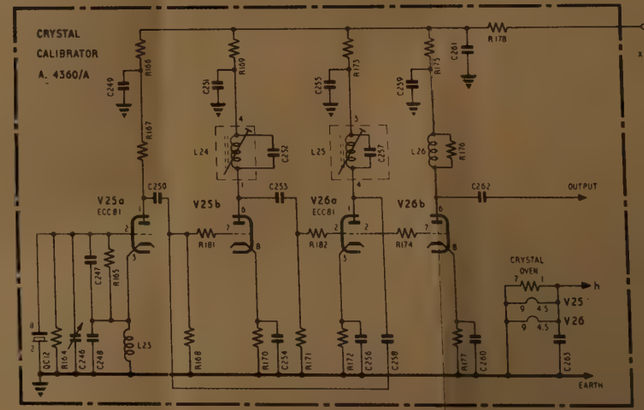


OPTIONAL UNIT


AE BAND 1 RF BAND 4 DRIVE
AE BAND 2 RF BAND 5 DRIVE
AE BAND 3 RF BAND 6 DRIVE
AE BAND 4 RF BAND 7 DRIVE
AE BAND 5 RF BAND 8 DRIVE
AE BAND 6 RF BAND 9 DRIVE
AE BAND 7 RF BAND 10 DRIVE
AE BAND 8 RF BAND 11 DRIVE
AE BAND 9 RF BAND 12 DRIVE
AE BAND 10 RF BAND 13 DRIVE
AE BAND 11 RF BAND 14 DRIVE
AE BAND 12 RF BAND 1 DRIVE
AE BAND 13 RF BAND 2 DRIVE
AE BAND 14 RF BAND 3 DRIVE

TURRET CIRCUIT DETAILS
A. 4222/A

BAND 1.	2 — 4 Mc/s	BAND 8.	16 — 18 Mc/s
BAND 2.	4 — 6 Mc/s	BAND 9.	18 — 20 Mc/s
BAND 3.	6 — 8 Mc/s	BAND 10.	20 — 22 Mc/s
BAND 4.	8 — 10 Mc/s	BAND 11.	22 — 24 Mc/s
BAND 5.	10 — 12 Mc/s	BAND 12.	24 — 26 Mc/s
BAND 6.	12 — 14 Mc/s	BAND 13.	26 — 28 Mc/s
BAND 7.	14 — 16 Mc/s	BAND 14.	28 — 30 Mc/s



OPTIONAL UNIT

DRAWN F.H. | TRACED M.S. | ENGINEER . | APPROVED

REDIFON LTD. LONDON. | TITLE | RECEIVER. TYPE R 145 | DWG. No. WDA/4119/1 | SH

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL ±%	RATING	ISSUE
	Resistors					
R1	Erie type 9		100K Ω	10		1
R2	Erie type 9		1.5M Ω	10		2
R3	Erie type 9		68 Ω	10		
R4	Welwyn type AW3111		17K Ω	5		3
R5A	Erie type 8) in parallel		47K Ω	10		
R5B	Erie type 8)		47K Ω	10		
R6	E. Turner meter shunt		30 mA			
R7	Erie type 9		470 Ω	10		
R8	Erie type 9		47K Ω	10		
R9	Erie type 9		470K Ω	10		
R10	Erie type 9		120 Ω	10		
R11	Colvern Pots. type CLR.1106/9S		Linear 5K Ω			
R12	Welwyn type AW3111		10K Ω	5		
R13	E. Turner meter shunt		30 mA			
R14	Erie type 9		1K Ω	10		
R15	Erie type 9		47K Ω	10		
R16A	Erie type 8) in parallel		47K Ω	10		
R16B	Erie type 8)		47K Ω	10		
R17	Erie type 9		120 Ω	10		
R18	Erie type 16		47K Ω	20		
R19	E. Turner meter shunt		10 mA			
R20	Erie type 9		1K Ω	10		
R21	Erie type 9		270 Ω	10		
R22	Erie type 8		47K Ω	10		
R23	Erie type 109		150 Ω	5		
R24	Erie type 9		4,700 Ω	10		
R25	E. Turner meter shunt		10 mA			
R26	Erie type 9		4,700 Ω	10		
R27	Erie type 9		82 Ω	10		
R28	Erie type 8		47K Ω	10		
R29	Erie type 9		47K Ω	10		
R30	Erie type 9		47K Ω	10		
R31	Erie type 9		220K Ω	10		
R32	Erie type 9		220K Ω	10		
R33	Erie type 9		47K Ω	10		
R34	Erie type 9		1K Ω	10		
R35	Erie type 9		47 Ω	10		

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REDIFON LTD. LONDON.	TITLE	SHEET	DWG. No.
	Receiver type R.145	2 Cont.	WDA/4119/S

SW.2103.

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
R36	Erie type 9		100K Ω	10		
R37						1
R38	Erie type 9		100K Ω	10		2
R39	Erie type 9		47K Ω	10		
R40	Erie type 9		27K Ω	10		3
R41	Erie type 9		47K Ω	10		
R42	Erie type 9		100K Ω	10		
R43	Erie type 9		47K Ω	10		
R44	Erie type 9		680 Ω	10		
R45	Erie type 8		4,700 Ω	10		
R46	E. Turner meter shunt		10 mA			
R47	Erie type 9		33K Ω	10		
R48	Erie type 8		47K Ω	10		
R49	Erie type 9		270K Ω	10		
R50	Erie type 9		270K Ω	10		
R51	Erie type 9		47K Ω	10		
R52	Erie type 9		1,200K Ω	10		
R53	Erie type 9		680 Ω	10		
R54	Erie type 9		15K Ω	10		
R55	Erie type 9		100K Ω	10		
R56	Erie type 9		6,800 Ω	10		
R57	Dubilier Pots. type YN	12/0P.3509/S	Log. 500K Ω			
R58	Erie type 9		100K Ω	10		
R59	Erie type 9		330 Ω	10		
R60	Erie type 9		560 Ω	10		
R61	Erie type 9		100K Ω	10		
R62	Erie type 9		47K Ω	10		
R63	Erie type 9		470K Ω	10		
R64	Erie type 8		270 Ω	10		
R65	E. Turner meter shunt		100 mA			
R66A	Erie type 8) in parallel		1K Ω	10		
R66B	Erie type 8)		1K Ω	10		
R67	Erie type 9		330 Ω	10		
R68	Erie type 9		560 Ω	10		
R69	Erie type 9		300 Ω	10		
R70	Erie type 9		300 Ω	10		
R71	Erie type 16		47K Ω	10		
R72	Erie type 16		10K Ω	10		

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 3 Cont.	DWG. No. WDA/4119/S

EW.808.

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
R73	Erie type 8		12K Ω	10		
R74	Erie type 16		47 Ω	10		1
R75	E. Turner meter shunt		30 mA			2
R76	Erie type 9		180 Ω	10		
R77	E. Turner meter shunt		10 mA			3
R78	Erie type 9		18K Ω	10		
R79	Erie type 9		27K Ω	10		
R80	Erie type 9		1,500 Ω	10		
R81	Erie type 9		68K Ω	10		
R82	Erie type 16		820 Ω	10		
R83	Erie type 16		47K Ω	10		
R84	Erie type 9		47K Ω	10		
R85	Erie type 16		27K Ω	10		
R86	Erie type 16		47K Ω	10		
R87	Erie type 16		180K Ω	10		
R88	Erie type 9		1.5M Ω	10		
R89	Erie type 9		330K Ω	10		
R90	Dubilier Pots. Type YN.	11/0P3509/S	Inverse Log. 50K Ω			
R91	Erie type 9		4,700 Ω	10		
R92						
R93	Erie type 9		27K Ω	10		
R94	Erie type 9		330K Ω	10		
R95	Erie type 9		1M Ω	10		
R96	Erie type 9		330K Ω	10		
R97	Erie type 9		1M Ω	10		
R98	Welwyn type AW3101		4 Ω	10		
R99	Welwyn type AW3101		4 Ω	10		
R100	Erie type 8		47OK Ω	10		
R101						
R102						
R103						
R104	Erie type 9		10K Ω	10		
R105	Erie type 9		180 Ω	10		
R106	E. Turner meter shunt		10 mA			
R107	Erie type 9		4,700 Ω	10		
R108	Erie type 9		1M Ω	10		
R109	Erie type 9		39K Ω	10		
R110	Erie type 8		15K Ω	10		

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 4 contd.	DWG.No. WDA/4119/S

EW.1103

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING
R111	E. Turner meter shunt		10 mA		
R112	Welwyn type AW3111		3,300 Ω	5	
R113					
R114					
R115					
R116					
R117					
R118					
R119	Erie type 108		300K Ω	2	
R120	Erie type 9		47K Ω	10	
R121	Erie type 9		1K Ω	10	
R122					
R123	Welwyn type AW3115		82 Ω	5	
R124	Welwyn type AW3115		82 Ω	5	
R125	Erie type 9		68K Ω	10	
R126					
R127					
R128					
R129					
R130					
R131					
R132					
R133					
R134	Colvern Pots. type CLR.1106/9S		Linear 5K Ω		
R135					
R136	Erie type 109		850 Ω	5	
R137					
R138	Colvern Pots. type CLR.1106/9S		Linear 100 Ω		
R139					
R140	Erie type 9		1K Ω	10	
R141	Erie type 9		180 Ω	10	
R142					
R143					
R144					
R145A	Erie type 8) in parallel		33K Ω	10	
R145B	Erie type 8)		33K Ω	10	
R146	Erie type 9)		100K Ω	10	
R146A	Erie type 9)	IF REQUIRED	AND VALUE DECIDED ON		TEST

ISSUE 1 2 3 4 5

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 5 Cont.	DWG.No. WDA/4119/S

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
R147	Erie type 16		4,700 Ω	10		1
R148	Erie type 16		6,800 Ω	10		2
R149	Erie type 16		15K Ω	10		3
R150	Erie type 16		4,700 Ω	10		4
R151	Erie type 16		6,800 Ω	10		5
R152	Erie type 16		6,800 Ω	10		
R153	Erie type 16		6,800 Ω	10		
R154	Erie type 16		47K Ω	20		
R155	Erie type 9		1K Ω	10		
R156	Erie type 16		3,900 Ω	10		
R157	Erie type 16		100K Ω	10		
R158	Erie type 8		1,800 Ω	10		
R159	Erie type 9		220 Ω	10		
R160	Erie type 9		220K Ω	10		
R161	Erie type 9		2,200 Ω	10		
R162						
R163	Erie type 9		47 Ω	10		
R164	Erie type 9		150K Ω	10		
R165	Erie type 9		470K Ω	10		
R166	Erie type 9		4,700 Ω	10		
R167	Erie type 9		4,700 Ω	10		
R168	Erie type 9		180K Ω	10		
R169	Erie type 9		4,700 Ω	10		
R170	Erie type 9		220 Ω	10		
R171	Erie type 9		180K Ω	10		
R172	Erie type 9		220 Ω	10		
R173	Erie type 9		4,700 Ω	10		
R174	Erie type 9		27K Ω	10		
R175	Erie type 9		4,700 Ω	10		
R176	Erie type 9		1K Ω	10		
R177	Erie type 9		1K Ω	10		
R178	Erie type 8		680 Ω	10		
R179	Erie type 16		220K Ω	10		
R180	Erie type 16		68 Ω	10		
R181	Erie type 9		100 Ω	10		
R182	Erie type 9		100 Ω	10		
R183	Erie type 9		100 Ω	10		

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 6 Cont.	DWG. No. WDA/4119/S

S.V.R.O.S.

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
	Condensers					
C1	Polar type C8-04		3.3 - 26.4 pF			1
C2	LEM type 1510		25 pF	2	350V	2
C3/9/17/23	Mullard type XB00275 4 gang					
C4	Erie type K1200.BD		1800 pF	20		3
C5	Hunts type W48. List No. A.301		.25 uF	20	150V	
C6	Hunts type W99. List No. B.807		.02 uF	20	150V	
C7	Hunts type W99. List No. B.810		.01 uF	20	400V	
C8	Hunts type W99. List No. B.810		.01 uF	20	400V	
C9	See C3					
C10	LEM type 1510		25 pF	2	350V	
C11	Hunts type W99. List No. B.807		.02 uF	20	150V	
C12	Hunts type W99. List No. B.807		.02 uF	20	150V	
C13	Hunts type W99. List No. B.807		.02 uF	20	150V	
C14	Hunts type W99. List No. B.810		.01 uF	20	400V	
C15	Hunts type W99. List No. B.810		.01 uF	20	400V	
C16	Hunts type W99. List No. B.810		.01 uF	20	400V	
C17	See C3					
C18	Polar type C31-11		3 - 19.5 pF			
C19	LEM type 1510		33 pF	10	350V	
C20	Hunts type W99. List No. B.858		.04 uF	10	150V	
C21	LEM type 1510		33 pF	10	350V	
C22	Polar type C31-13		3.3 - 19.8 pF			
C23	See C3					
C24	Hunts type W99. List No. B.810		.01 uF	20	400V	
C25	Hunts type W99. List No. B.807		.02 uF	20	150V	
C26	Hunts type W48. List No. A.312		.1 uF	20	350V	
C27	LEM type 2515		580 pF	2	350V	
C28	Hunts type W99. List No. B.807		.02 uF	20	150V	
C29	LEM Type 2515		580 pF	2	350V	
C30	LEM type 2515		600 pF	2	350V	
C31	Polar type C32-01		1.25 - 4.5 pF			
C32	Hunts type W99. List No. B.807		.02 uF	20	150V	
C33	Hunts type W99. List No. B.810		.01 uF	20	400V	
C34	Hunts type W99. List No. B.810		.01 uF	20	400V	
C35	LEM type 2515		580 pF	2	350V	
C36	LEM type 1510		4 pF	½ pF	350V	
C37	LEM type 2515		580 pF	2	350V	

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REDIFON LTD. LONDON.	TITLE	SHEET	DWG. No.
	Receiver type R.145	7 Cont.	WDA/4119/S

S.W.B.O.S.

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
C38	Hunts type W99. List No. B.810		.01 uF	20	400V	
C39	Hunts type W99. List No. B.810		.01 uF	20	400V	1
C40	Hunts type W99. List No. B.807		.02 uF	20	150V	2
C41	LEM type 2515		580 pF	2	350V	
C42	LEM type 1510		4 pF	½ pF	350V	3
C43	LEM type 2515		535 pF	2	350V	
C44	LEM type 1510		45 pF	2	350V	
C45	LEM type 1510		500 pF	10	350V	
C46	Hunts type W99. List No. B.810		.01 uF	20	400V	
C47	Hunts type W99. List No. B.810		.01 uF	20	400V	
C48	TCC type 425 SMP		300 pF	20	350V	
C49	SRC type 50B		1350 pF	2	350V	
C50	Polar type C8-02		6.5 - 149 pF			
C51	LEM type 1510		60 pF	2	350V	
C52	Erie type N750 BD.		120 pF	10		
C53	LEM type 1510		85 pF	10	350V	
C54	Erie type N750 BD.		120 pF	10		
C55	LEM type 1510		4 pF	½ pF	350V	
C56	LEM type 2010		190 pF	2	350V	
C57	LEM type 1510		4 pF	½ pF	350V	
C58	Hunts type W48. List No. A.300		.1 uF	20	150V	
C59	LEM type 2515		1,000 pF	2	350V	
C60	Hunts type W48. List No. A.312		.1 uF	20	350V	
C61	LEM type 2515		330 pF	2	350V	
C62	LEM type 2515		330 pF	2	350V	
C63	Hunts type W48. List No. A.300		.1 uF	20	150V	
C64	LEM type 2515		330 pF	2	350V	
C65	LEM type 2515		330 pF	2	350V	
C66	Hunts type W48. List No. A.312		.1 uF	20	350V	
C67	LEM type 2515		330 pF	2	350V	
C68	LEM type 2515		370 pF	20	350V	
C69	LEM type 2515		2,600 pF	2	350V	
C70	LEM type 2515		330 pF	2	350V	
C71	LEM type 2515		370 pF	20	350V	
C72	Erie type K1200 BD		1,000 pF	20	500V	
C73	Hunts type W54. List No.WP.210		2 uF	20	500V	
C74	Hunts type W48. List No. A.312		.1 uF	20	350V	
C75	Hunts type W48. List No. A.312		.1 uF	20	350V	

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 8 Cont.	DWG. No. WDA/4119/S

S.W.B.O.S.

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
C76	Hunts type W48. List No.A.300		.1 uf	20	150V	
C77	LEM type 2515		580 pF	2	350V	6
C78	LEM type 2515		515 pF	2	350V	
C79	LEM type 2515		580 pF	2	350V	7
C80	Erie type CD.8		100 pF	10	V	
C81	Hunts type L38/1. List No.JE27T		50 uf	+INF -20	12V	
C82	Plessey type CE511/18		16 uf	+50 -20	450V	
C83	Hunts type W99. List No. B.810		.01 uf	20	400V	
C84	LEM type 2010		1200 pF	5	350V	
C85	LEM type 1510		5 pF	10	350V	
C86	LEM type 1510		200 pF	5	350V	
C87	Mullard type 7864/01		3 - 30 pF			
C88	Mullard type 7864/01		3 - 30 pF			
C89	Mullard type 7864/01		3 - 30 pF			
C90	Mullard type 7864/01		3 - 30 pF			
C91	Mullard type 7864/01		3 - 30 pF			
C92	Mullard type 7864/01		3 - 30 pF			
C93	Mullard type 7864/01		3 - 30 pF			
C94	Hunts type W99. List No. B.807		.02 uf	20	150V	
C95	Hunts type W99. List No. B.807		.02 uf	20	150V	
C96	Hunts type W99. List No. B.807		.02 uf	20	150V	
C97	Erie type N750. BD.		120 pF	10		
C98	Hunts type W99. List No. B.810		.01 uf	20	400V	
C99	Hunts type W48. List No. A.300		.1 uf	20	150V	
C100	LEM type 1510		30 pF	½ pF	350V	
C101	Hunts type W97. List No. BM.21		.01 uf	20	400V	
C102						
C103	Hunts type W99. List No. B.807		.02 uf	20	150V	
C104	Hunts type W99. List No. B.807		.02 uf	20	150V	
C105	Hunts type W99. List No. B.807		.02 uf	20	150V	
C106	LEM type 1106		100 pF	10	350V	
C107	Erie style K. N330		20 pF	5	350V	
C108	Polar type C31-11		3 - 19.5 pF			
C109A	LEM type 1106)		850 pF	1	350V	
C109B	TCC type SCT4. Fin F) in parallel		510 pF	1	350V	
C110	Mullard type XU.05600					
C111	Hunts type W48. List No. A.302		.5 uf	20	150V	
C112	Hunts type W48. List No. A.312		.1 uf	20	350V	

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 9 Cont.	DWG.No. WDA/4119/S

S.W.11.08.

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
C113	Hunts type W99. List No. B.810		.01 uF	20	400V	
C114	Erie type N750. BD.		120 pF	10	350V	1
C115	Hunts type W99. List No. B.807		.02 uF	20	150V	
C116	Hunts type W99. List No. B.810		.01 uF	20	400V	2
C117	Hunts type W48. List No. A.300		.1 uF	20	150V	
C118	LEM type 2515		420 pF	2	350V	
C119	Hunts type W48. List No. A.312		.1 uF	20	350V	
C120	Erie type N750 BD.		120 pF	10		
C121	Hunts type W48. List No. A.312		.1 uF	20	350V	
C122	Erie type K1200 BD.		1800 pF	20		
C123	Dubilier type AB. Cat.Ref.B.1092		8 uF	20	350V	
C124	Hunts type L32/1. List No.KB254T		100 uF	+50 -20	275V	
C125	Hunts type L32/1. List No.KB254T		100 uF	+50 -20	275V	
C126						
C127						
C128						
C129						
C130						
C131						
C132	SRC Type 10B		15 pF	10	350V	
C133	LEM type 1510		20 pF	10	350V	
C134	LEM type 1510		33 pF	10	350V	
C135	SRC type 15B		410 pF	½	350V	
C136	LEM type 1510		33 pF	10	350V	
C137	LEM type 2515		410 pF	½	350V	
C138	LEM type 1510		45 pF	10	350V	
C139	LEM type 2010		215 pF	½	350V	
C140	LEM type 1510		45 pF	10	350V	
C141	LEM type 2010		215 pF	½	350V	
C142	LEM type 1510		40 pF	½ pF	350V	
C143	LEM type 2010		152 pF	½	350V	
C144	LEM type 2010		152 pF	½	350V	
C145	LEM type 1510		40 pF	½ pF	350V	
C146	LEM type 1510		40 pF	½ pF	350V	
C147	LEM type 1510		129 pF	½	350V	
C148	LEM type 1510		20 pF	10	350V	
C149	LEM type 1510		129 pF	½	350V	
C150	LEM type 1510		40 pF	½ pF	350V	

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 10 cont.	DWG. No. WDA/4119/S

S.W.B.O.S.

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
C151	LEM type 1510		50 pF	1	350V	
C152	LEM type 1510		99 pF	½ pF	350V	1
C153	LEM type 1510		99 pF	½ pF	350V	2
C154	LEM type 1510		50 pF	1	350V	
C155	LEM type 1510		50 pF	1	350V	3
C156	LEM type 1510		92 pF	½ pF	350V	
C157	LEM type 1510		92 pF	½ pF	350V	
C158	LEM type 1510		50 pF	1	350V	
C159	LEM type 1510		50 pF	1	350V	
C160	LEM type 1510		83 pF	½ pF	350V	
C161	LEM type 1510		20 pF	10	350V	
C162	LEM type 1510		83 pF	½ pF	350V	
C163	LEM type 1510		50 pF	1	350V	
C164	LEM type 1510		37 pF	½ pF	350V	
C165	LEM type 1510		20 pF	10	350V	
C166	LEM type 1510		79 pF	½ pF	350V	
C167	LEM type 1510		50 pF	1	350V	
C168	LEM type 1510		140 pF	1	350V	
C169	LEM type 1510		35 pF	½ pF	350V	
C170	LEM type 1510		64 pF	½ pF	350V	
C171	LEM type 1510		60 pF	1	350V	
C172	LEM type 1510		100 pF	5	350V	
C173	LEM type 1510		32 pF	½ pF	350V	
C174	LEM type 1510		60 pF	1	350V	
C175	LEM type 1510		60 pF	1	350V	
C176	LEM type 1510		85 pF	10	350V	
C177	LEM type 1510		30 pF	½ pF	350V	
C178	LEM type 1510		57 pF	½ pF	350V	
C179	LEM type 1510		60 pF	1	350V	
C180	LEM type 1510		75 pF	5	350V	
C181	Polar type C31-13		3.3 - 19.8 pF			
C182	Polar type C31-13		3.3 - 19.8 pF			
C183	Polar type C31-13		3.3 - 19.8 pF			
C184	Polar type C31-13		3.3 - 19.8 pF			
C185	Polar type C31-13		3.3 - 19.8 pF			
C186	Polar type C31-13		3.3 - 19.8 pF			
C187	Polar type C31-13		3.3 - 19.8 pF			
C188	Polar type C31-13		3.3 - 19.8 pF			

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 11 Cont	DWG. No. WDA/4119/S

E.W.B.O.S.

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING
C189	Polar type C31013		3.3 - 19.8 pF		
C190	Polar type C31-13		3.3 - 19.8 pF		
C191	Polar type C31-13		3.3 - 19.8 pF		
C192	Polar type C31-13		3.3 - 19.8 pF		
C193	Polar type C31-13		3.3 - 19.8 pF		
C194	Erie type K1200 BD.		1800 pF	20	
C195	Erie type K1200 BD.		1800 pF	20	
C196	Erie type K1200 BD.		1800 pF	20	
C197	Erie type K1200 BD.		1800 pF	20	
C198	Polar type C31-13		3.3 - 19.8 pF		
C199	LEM type 1510		4 pF	½ pF	350V
C200	Hunts type W48. List No. A.300		.1 uF	20	150V
C201	Hunts type W99. List No. B.807		.02 uF	20	150V
C202	Hunts type W99. List No. B.810		.01 uF	20	400V
C203	Erie type K1200 AD.		300 pF	20	
C204	Erie type K1200 AD.		250 pF	20	
C205	Erie type K1200 AD.		250 pF	20	
C206	Erie type K1200 AD.		250 pF	20	
C207	Erie type K1200 AD.		250 pF	20	
C208	LEM type 1510		330 pF	5	350V
C209	Erie type K1200 AD.		250 pF	20	
C210	LEM type 1510		330 pF	5	350V
C211	Hunts type W97. List No. BM.21		.01 uF	20	400V
C212	LEM type 2515		270 pF	2	350V
C213	LEM type 2515		270 pF	2	350V
C214	TCC type CC125S		2 pF	20	500V
C215	Hunts type W99. List No. B.807		.02 uF	20	150V
C216	Hunts type W99. List No. B.810		.01 uF	20	400V
C217	Mullard type 7864/01		3 - 30 pF		
C218	LEM type 1510		28 pF	½ pF	350V
C219	LEM type 2515		300 pF	20	350V
C220	Erie type K1200 BD.		1800 pF	20	
C221	LEM type 1510		85 pF	10	350V
C222	LEM type 1510		60 pF	½ pF	350V
C223	LEM type 1510		33 pF	10	350V
C224	FEC type 4271.750.		300 pF	5	350V
C225	LEM type 1510		60 pF	1	350V
C226	LEM type 1510		26.5 pF	½ pF	350V

ISSUE 1 2 3 4

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 12 cont.	DWG.No. WDA/4119/S

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
C227	TCC type 425 SMP		300 pF	20	350V	
C228	Erie type K1200 BD.		1800 pF	20		1
C229	LEM type 1510		70 pF	5	350V	2
C230	LEM type 1510		56 pF	½ pF	350V	3
C231	LEM type 1510		60 pF	10	350V	4
C232	Hunts type M301. List No. AM102		.1 uF	5	250V	5
C233	LEM type 1510		60 pF	1	350V	6
C234	LEM type 1510		10 pF	10	350V	
C235	Hunts type W99. List No. B.810		.01 uF	20	400V	7
C236	Erie type N750 BD.		75 pF	20		
C237	Erie type N750 BD.		75 pF	20		
C238	Hunts type W99. List No. B.807		.02 uF	20	150V	
C239	Erie type N750 BD.		120 pF	10	350V	
C240	Mullard type 7864		3 - 30 pF			
C241	Hunts type W99. List No. B.807		.02 uF	20	150V	
C242	Hunts type W99. List No. B.807		.02 uF	20	150V	
C243	LEM type 1510		150 pF	10	350V	
C244	Hunts type W48. List No. A.301		.25 uF	20	150V	
C245	Hunts type W99. List No. B.807		.02 uF	20	150V	
C246	Polar type C31-13		3.3 - 19.8 pF			
C247	LEM type 1510		15 pF	10	350V	
C248	LEM type 1510		100 pF	10	350V	
C249	Hunts type W99. List No. B.810		.01 uF	20	400V	
C250	LEM type 2010		150 pF	10	350V	
C251	Hunts type W48. List No. A.312		.1 uF	20	350V	
C252	LEM type 2010		1200 pF	5	350V	
C253	SRC type N750/38		70 pF	10		
C254	Hunts type W48. List No. A.300		.1 uF	20	150V	
C255	Hunts type W48. List No. A.312		.1 uF	20	350V	
C256	Hunts type W48. List No. A.300		.1 uF	20	150V	
C257	LEM type 1510		330 pF	5	350V	
C258	LEM type 2010		150 pF	10	350V	
C259	Hunts type W48. List No. A.312		.1 uF	20	350V	
C260	Hunts type W48. List No. A.300		.1 uF	20	150V	
C261	Hunts type W48. List No. A.312		.1 uF	20	350V	
C262	Hunts type W99. List No. B.810		.01 uF	20	400V	
C263	Hunts type W48. List No. A.300		.1 uF	20	150V	
C264	TCC type SCD1. Fin A.		3 pF	½ pF	500V	

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 13 Cont.	DWG.No. WDA/4119/S

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
C265	Hunts type W48. List No.A.300A		.1 uF	10	150V	
C266	Erie type K1200 BD		1800 pF	20		1
C267	Hunts type W99 List No. B.807		.02 uF	20	150V	
C268	Hunts type W99 List No. B.807		.02 uF	20	150V	2
C269	LEM type 1510		100 pF	5	350V	
C270	LEM type 1510		100 pF	5	350V	
C271	LEM type 1510		120 pF	5	350V	
C272	LEM type 1510		100 pF	5	350V	
C273	LEM type 1510		220 pF	5	350V	
C274	LEM type 1510		50 pF	1	350V	
C275	LEM type 1510		100 pF	5	350V	
C276	LEM type 1510		100 pF	5	350V	
C277	LEM type 1510		100 pF	5	350V	
C278	LEM type 1510		25 pF	10	350V	
C279	LEM type 1510		92 pF	½ pF	350V	
C280	LEM type 1510		5 pF	10	350V	
C281	TCC type SCD1 Fin A		3 pF	½ pF	500V	
C282	LEM type 1510		5 pF	10	350V	
C283	LEM type 1510		5 pF	10	350V	
C284	TCC type SCD1 Fin A		3 pF	½ pF	500V	

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 14 Cont.	DWG.No. WDA/4119/S

S.W.B.O.S.

CIR. REF.	COMPONENT DESCRIPTION.	REF No.	VALUE	TOL %	RATING	ISSUE
	Switches					
SWA	NSF 10 pole 5 pos.	OP.3675/M				1
SWB	NSF Z510304 DPDT					2
SWC	NSF Z510304 DPDT					3
SWD	NSF Z510304 DPDT					
SWE	NSF Z510304 DPDT					4
SWF	Plessey 4 pole 3 pos.	OP.4630/S				
SWG	Redifon 2 pole 14 pos.	91/4363/M				
SWH	NSF 8370/B6 DPST					
SWJ						
SWK	NSF 2 pole 3 pos.	OP.4770/M				
SWL	NSF 3 pole 3 pos.	OP.3677/M				
SWM	NSF 2 pole 12 pos.	OP.3909/S				
SWN						
SWP	Burgess Micro Switch BRL.2R					
	Crystals			%		
QC1	)	OP.3862/S	455 kc/s	±0.1		
QC2	QCC)		565 kc/s	±.015		
QC3	QCC)		345 kc/s	±.015		
QC4	GEC)		13 Mc/s	±.002		
QC5	GEC)		11 Mc/s	±.002		
QC6	GEC) To Redifon		6 Mc/s	±.002		
QC7	GEC) form RP.178.		14 Mc/s	±.002		
QC8	GEC)		10 Mc/s	±.002		
QC9	Marconi)		4 Mc/s	±.0015		
QC10	Marconi)		2 Mc/s	±.002		
QC11	GEC)	OP.4586/S	110 kc/s	±.01		
QC12	)	OP.4680/S	2.5 Mc/s	-0 +.006		

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 15 Cont	DWG. No. WDA/4119/S

CIR. REF.	COMPONENT DESCRIPTION.		REF. No.	VALUE	TOL %	RATING	ISSUE
	Valves	Alternative					
V1	Brimar 6BA6	EF93					1
V2	Mullard ECH81						2
V3	Mullard ECH81						3
V4	Mullard ECH81						
V5	Brimar 6BA6	EF93					4
V6	Brimar 6BA6	EF93					
V7	Mullard EB91	6AL5					
V8	Mullard ECC81	12AT7					
V9	Brimar 12AU7	ECC82					
V10	Mullard EF91	6AM6					
V11	Mullard EF93	6BA6					
V12	Mullard EB91	6AL5					
V13	Mullard EF91	6AM6					
V14	Brimar 6AQ5	EL90					
V15	Mullard E180F						
V16	Mullard EF91	6AM6					
V17	Mullard EF91	6AM6					
V18	Brimar 6AT6						
V19							
V20	Mullard EF91	6AM6					
V21	Mullard EF91	6AM6					
V22	Brimar 6X4	EZ90					
V23	Brimar 6X4	EZ90					
V24	Mullard 150C4	OA2					
V25	Brimar 12AT7	ECC81					
V26	Brimar 12AT7	ECC81					
	Transformers						
T1	Transformer		181/4361/M				
T2	I.F. transformer		145/4362/M				
T3	I.F. transformer		199/4362/M				
T4	I.F. transformer		253/4362/M				
T5	Transformer		73/4224/M				
T6	Transformer		127/4224/M				
T7	Transformer		181/4224/M				
T8	Output		SR/T.2364				
T9	Mains		SR/T.2363				
T10	I.F. Transformer		307/4362/M				

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 16 cont.	DWG. No. WDA/4119/S

S.W.B.O.S.

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
	Lamps					
LP1	MES. 1.6W 8V					1
LP2	MES. 1.6W 8V					2
						3
						4
	Plugs & Sockets					
PL1	Bulgin type P.73					
SK1	Belling Lee type L734/S					
SK2	Belling Lee type L734/S					
SK3	Painton type S4/MFS.					
	Rectifiers					
W1	Mullard Germanium Diode type OA.	81.				
W2	Mullard Germanium Diode type CA.	81.				
W3	Mullard Germanium Diode type OA.	81.				
W4	S.T. & C. type H18-8-1RWZ					
W5						
W6	Mullard Germanium Diode type OA.	81.				
	Fuses					
F1	Belling Lee type L1055		1A(200-250V)2A(100-125V)			
F2	Belling Lee type L1055		1A(200-250V)2A(100-125V)			
F3	Belling Lee type L1055		250 mA			
M1	E. Turner Meter	6/CP.1330/S				
J1	Igranic Jack P.73					
J2	Igranic Jack P.73					
J3	Igranic Jack P.73					

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REDIFON LTD. LONDON.	TITLE Receiver Type R.145	SHEET 17 cont.	DWG.No. WDA/4119/S

CIR. REF.	COMPONENT DESCRIPTION.	REF. No.	VALUE	TOL %	RATING	ISSUE
	Coils					
L1	Mixer coil	73/4361/M				1
L2	I.F. Coil	91/4362/M				2
L3	B.F.O. Coil Main Deck	254/4119/S				3
L4	Main Deck)	272/4119/S				4
L5	Main Deck)	272/4119/S				
L6	S.S.B	235/4224/M				5
L7	S.S.B.	289/4224/S				
L8	Mullard Filter	OP.3911/S.				
L9	Bulgin type SW68	2/P.18632/S				
L10	Heater choke	P.25764/S				
L11						
L12	V.F.O. coil	73/4358/S				
L13	Heater choke	P.25764/S				
L14	Heater choke	P.25764/S				
L15	S.S.B.	307/4224/S				
L16	Varley choke	SR/T.443				
L17						
L18						
L19						
L20						
L21	Mixer	271/4361/S				
L22	Mullard Filter	OP.4640/S				
L23	Bulgin type SW68	2/P.18632/S				
L24	Xtal Coil	74/4360/S				
L25	Xtal Coil	62/4360/S				
L26	Xtal Coil	127/4360/S				

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REDIFON LTD. LONDON.	TITLE Receiver type R.145	SHEET 1£	DWG.No. WDA/4119/S

MP MASTER
MA23859